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SOLUTION: The multilayer woven fabric for industrial use is provided with at least an upper face side layer and a moving-face side layer connected with each other by a yarn binding warp-ground yarns weaving the upper face side layer and the moving face side layer. The yarn for binding a warp and a ground yarn is used at least as the upper face side warp. The moving face side warp passes under a plurality of consecutive moving face side wefts to form a long crimp at the moving face side.

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CLAIMS

[Claim(s)]

[Claim 1]

The industrial-use multilayer textiles characterized by to have a top-face side layer and transit ***** at least, to use some or all of top-face side warp as a warp ground-yarn binder yarn in the industrial-use multilayer textiles which come to connect a top-face side layer and transit ***** with the warp ground-yarn binder yarn which weaves a top-face side layer and transit ***** , to pass the transit side side [two or more] woof bottom which transit side side warp follows, and to form long crimp in a transit side side.

[Claim 2]

Industrial use multilayer textiles which are characterized by the location where a warp ground yarn binder yarn passes the transit side side woof bottom, and carries out binding of the transit ***** being a location which is approaching the top-face side between the parts where the transit side side woof passes the transit side side warp bottom and which were indicated by claim 1.

[Claim 3]

Industrial use multilayer textiles which form a warp ground yarn binder yarn by 2 sets [1], the warp ground yarn binder yarn of 1 set of these two books appears in a top-face side by turns, weave with the top-face side woof, and form the organization of real very best side side warp 1 duty in a top-face side front face and which were indicated by claims 1 or 2.

[Claim 4]

Warp ground yarn binder yarns are industrial use multilayer textiles which are the binder yarns which this binder yarn falls in a transit side side, and pass the transit side side woof bottom in the part or all the locations between the parts which pass the top-face side [1 or 2] woof bottom and which were indicated by claims 1 or 2.

[Claim 5]

The auxiliary woof binder yarn which passes the two or more top-face side warp bottom which adjoins between the top-face side woof, and forms crimp in a top-face side front face is arranged by 2 sets [1]. Industrial use multilayer textiles indicated by claim 1 characterized by for the auxiliary woof binder yarn of 1 set of these two books appearing in a top-face side front face by turns, weaving with top-face side warp, and forming the organization of auxiliary-on parenchyma woof binder yarn 1 duty in a top-face side thru/or any 1 term of 4.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]

This invention relates to industrial use textiles, such as textiles for paper making, a conveyance belt, and a filter cloth.

[0002]

[Description of the Prior Art]

As industrial use textiles, the textiles which carried out weaving are widely used by warp and the woof from the former, for example, it is used in many of other fields, such as a wire for paper making, and a belt for conveyance, a filter cloth, and the textile property suitable for an application or an operating environment is demanded. The textiles which can maintain conditions required [a demand with the wire for paper making used like the paper maker which performs dehydration of a raw material etc. especially using the mesh of textiles is severe and] in order to manufacture textiles excellent in the front-face nature which does not imprint the wire mark of textiles on paper, the thing which had the rigidity of extent which can be suitably used for the bottom of a harsh environment with it, and good paper for a long period of time are demanded. In addition, improvement in the yield of fiber support nature and paper manufacture, good filterability, abrasion resistance, dimensional stability, transit stability, etc. are demanded. Furthermore, in recent years, since the paper-making machine has accelerated, in connection with it, the demand on the wire for paper making is also severer.

Thus, since he can understand about a demand and its solution of almost all industrial use textiles if a demand explains the severe textiles for paper making also in industrial use textiles, on behalf of the textiles for paper making, this invention is explained below.

For example, if paper-making speed becomes a high speed, dehydration speed needs to become a high speed inevitably and it is necessary to make the dehydration force powerful. Since generating of omissions, such as fiber and a loading material, and a wire mark naturally becomes remarkable by it, amelioration of the further fiber support nature and front-face nature is needed. Moreover, if a pile lump of a wet paper web becomes large or a ***** lump of fiber occurs on the textiles for paper making, the problem that the wet paper web detachability in the case of transporting a wet paper web to the felt worsens will also be generated. Between the meshes in which yarn is hard a wet paper web in the part in which yarn exists, and yarn does not exist conversely according to it since it is pushed against a textile front face by the dehydration force, the wet paper web of the wet paper web remained and formed on textiles is for being hard and generating the mark of yarn and a mesh on a wet paper web front face a mesh. Although it is impossible to lose a wire mark completely, in order are not small conspicuous and to carry out this as much as possible, the upper front face of textiles must be made fine, and improvement in surface smooth nature and fiber support nature must be aimed at. However, since weaving of the textiles with the fine eye which thought front-face nature and fiber support nature as important was fundamentally carried out with the small yarn of a wire size, they were inferior to abrasion resistance.

Moreover, since the textiles for paper making run at high speed, in the transit side side of the side in contact with a machine, the phenomenon of wearing textiles out gradually by friction with a roll etc. is seen, and a life may be exhausted with wear. Various cures are needed with it being as changing

the quality of the material of yarn **** [, and], and, generally the approach of making it into antifriction structure using the large yarn of especially a wire size etc. is used. [acting as a textile organization in the organization of a woof wear mold raising abrasion resistance] However, it was difficult for the large yarn of a wire size to obtain the front-face nature which was excellent although abrasion resistance improved.

In order to solve the problem of both front-face nature and abrasion resistance, the textiles of two sheets constituted using respectively different warp and the woof in a top-face side layer and transit ***** were used, and the two-layer textiles which made the textiles of both layers unify with a binder yarn have been used. This approach was effective in the textiles according to the engine performance required of each being employable. The small warp of a wire size and the woof were used for the top-face side layer, the precise upper side was formed, and the wear-resistant large transit side was formed in transit ***** using the large warp of a wire size, and the woof. In order not to reduce front-face nature to a binder yarn, generally the yarn of a minor diameter was used from top-face side warp and the top-face side woof. Although plain weave is used in many cases in order that a top-face side organization may form a precise front face, since a binder yarn is used in order to weave two layers in fact, the front face where the binder yarn has been arranged in some places will be formed in a real plain weave front face. Since the part which appears in a front face in this way also existed, as for the binder yarn, it was not desirable to have used large yarn out of a wire size from the problem of surface smooth nature.

[0003]

Moreover, as textiles for paper manufacture, usually pass at the time of use, and tension is applied to a direction in many cases. By passing, although warp hardly loosens and moves by transit of textiles since it is in the condition that tension is always applied, the yarn of a direction In the binder yarn with being arranged [much] between the woof from problems, such as weaving nature and fiber support nature, when tension was applied, it might be extended, or the binder yarn might be rubbed between a top-face side layer and transit ***** , internal wear might occur, and the problem of a clearance occurring or dissociating between textiles might arise. This is because endless-like textiles are hung on some rolls and it is running, in the part in which textiles contact a roll, two-layer textiles curve along with the arc of a roll, and a perimeter difference produces it on each class of textiles. The binder yarn which weaves each class is rubbed by it, and internal wear occurs by it. The wire size currently used the sake [on a surface disposition] can see internal wear well with a small binder yarn. Binding of the top-face side layer of only the small binder yarn of a wire size and transit ***** had the inadequate binding force. Moreover, the binder yarn coiled around the yarn of a top-face side layer, in order to connect the textiles of two sheets, and in order to draw yarn according to the binding force, it also had the problem of giving a depression to a top-face side front face, and worsening the front-face nature of textiles.

Then, although it passes and a top-face side front face is formed in the yarn of a direction, development of the multilayer textiles using the warp ground yarn binder yarn which weaves a top-face side layer and transit ***** has been carried out. In the top-face side layer, top-face side warp and a warp ground yarn binder yarn were used for the warp which forms a top-face side front face, it wove with the top-face side woof, and the top-face side front face was formed. Transit ***** was formed by transit side side warp and the transit side side woof. The textiles which used as the warp ground yarn binder yarn all the warp that furthermore forms a top-face side layer for the purpose of improvement in the binding force or equalization of an opening were developed.

Thus, the binding force can be strengthened with using as a warp ground yarn binder yarn the binder yarn which weaves two layers, generating of internal wear can be prevented, and it can consider as the textiles which do not worsen front-face nature. However, with multilayer textiles, it also had the binding force and problems other than front-face nature. For example, a mark may be given to a wet paper web when dehydration nature is uneven also as an organization using a warp ground yarn binder yarn. In order that this may raise abrasion resistance, it may become a cause to have considered transit ***** as the woof wear mold organization. The textiles for paper manufacture etc. use as a woof wear mold the transit side side front face which touches a machine so that a life may not be exhausted with wear in many cases. Usually, textiles are running along the direction of warp, where tension is applied in the extended direction of warp, but when warp cuts by wear etc., it

is because it becomes impossible to use it more than it. In order to make wear of warp mitigate, it is hard coming to cut warp by mainly burdening the woof with wear. However, since the slot on the cross direction generated this woof wear mold organization between the woof, it might become difficult for some dehydrators, such as foil and a blade, to enter this slot like a wedge, and to run smoothly, and it might become impossible to make use continue in response to intense wear by which the bottom woof was struck.

[0004]

[Problem(s) to be Solved by the Invention]

It is it arranging the warp ground yarn binder yarn which connects a top-face side layer and transit ***** by 2 sets [1], this invention's being woven with the top-face side woof, and forming a part of top-face side front face in view of the above-mentioned problem, and making transit ***** into warp wear mold structure. Even if dehydration capacity is a powerful machine at high speed, gap of fibrillation and yarn of internal wear and yarn does not occur, and filterability is uniform. It is going to offer the industrial use multilayer textiles which can run smoothly and can be used for a long period of time so that the binding force may be strong, and it may excel in surface smooth nature and it may slide on a dehydrator top.

[0005]

[Means for Solving the Problem]

This invention,

- "1. In the industrial use multilayer textiles which come to connect a top-face side layer and transit ***** with the warp ground yarn binder yarn which is equipped with a top-face side layer and transit ***** at least, and weaves a top-face side layer and transit ***** Industrial use multilayer textiles which use some or all of top-face side warp as a warp ground yarn binder yarn, and are characterized by passing the transit side side [two or more] woof bottom which transit side side warp follows, and forming long crimp in a transit side side.
2. Industrial use multilayer textiles which are characterized by location where warp ground yarn binder yarn passes the transit side side woof bottom, and carries out binding of transit ***** being location which is approaching top-face side between parts where the transit side side woof passes the transit side side warp bottom and which were indicated by the 1st term.
3. a warp ground yarn binder yarn -- 2 sets [1] -- forming -- this -- the industrial use multilayer textiles indicated by the 1st term or the 2nd term which 2 1 set of warp ground yarn binder yarn appears in a top-face side by turns, weaves with the top-face side woof, and forms the organization of real very best side side warp 1 duty in a top-face side front face.
4. Warp ground yarn binder yarns are the industrial use multilayer textiles indicated by the 1st term or the 2nd term which is the binder yarn which this binder yarn falls in a transit side side, and passes the transit side side woof bottom in the part or all the locations between the parts which pass the top-face side [1 or 2] woof bottom.
5. Arrange Auxiliary Woof Binder Yarn Which Passes Two or More Top-Face Side Warp Bottom Which Adjoins between Top-Face Side Woof, and Forms Crimp in Top-Face Side Front Face by 2 Sets [1]. this -- industrial use multilayer textiles indicated by any 1 term of the 1st term characterized by for 1 set of 2 auxiliary woof binder yarns appearing in a top-face side front face by turns, weaving with top-face side warp, and forming the organization of auxiliary-on parenchyma woof binder yarn 1 duty in a top-face side thru/or the 4th term. "

It is alike and is related.

[0006]

[Embodiment of the Invention]

The industrial use textiles of this invention can be used as industrial use textiles, such as a wire for paper making, a belt for conveyance, and a filter cloth, and can be especially used suitably as a severe wire for paper making of the demand from a user.

This invention was equipped with a top-face side layer and transit ***** at least, it used them as the warp ground yarn binder yarn which weaves a top-face side layer and transit ***** , forming a top-face side front face for some or all of top-face side warp, and used the transit side side organization as the two-layer textiles of a warp wear mold. Since it can run smoothly so that gap of fibrillation and yarn of internal wear and yarn does not occur, and filterability may be uniform, and it

may excel in the binding force and surface smooth nature and it may slide on a dehydrator top even if dehydration capacity is a powerful machine in considering as such an organization at high speed, the textiles which can be used for a long period of time can be offered.

Although the multilayer textiles of this invention formed a part of top-face side front face, they have arranged the warp ground yarn binder yarn which connects a top-face side layer and transit ***** in the textile transit direction. And the top-face side front face of textiles is woven with the top-face side woof, and forms the precise front face.

Moreover, about the transit side side textiles organization, it considered as the warp wear mold organization which passes along the transit side side [two or more] woof bottom which transit side side warp follows. And the location where a warp ground yarn binder yarn passes the transit side side woof bottom, and carries out binding of the transit ***** considered as the location which is approaching the top-face side between the parts where the transit side side woof passes the transit side side warp bottom.

[0007]

Since unlike the binder yarn which does not participate in surface histogenesis only by [conventional] carrying out binding this warp ground yarn binder yarn appears in a top-face side front face and forms a part of textile front face like top-face side warp, the effectiveness by carrying out binding of the textiles with the warp ground yarn binder yarn which is the description of this invention does not affect a surface organization. Moreover, since the warp ground yarn binder yarn is used where it passed, it was extended in the direction, i.e., the transit direction generally said, and tension is always applied, even if it does not have generating of yarn of sag and it sees it from textile structure, it is in the inclination for the binding force to be strong. Although the binding force can be further strengthened when especially the warp ground yarn binder yarn has been arranged by 2 sets [1], 2 1 set of warp ground yarn binder yarn is the bottom in which one side passes the top-face side [1 or 2] woof bottom, weaves with the top-face side woof, and forms the front face, and another warp ground yarn binder yarn should just make it the transit side side woof and the structure where it was woven. Since two warp ground yarn binding appears in a top-face side front face by turns and is functioning like one warp, a surface organization is not broken down.

In addition, it is good also as an organization using an one warp ground yarn binder yarn. For example, there is an organization which has arranged an one warp ground yarn binder yarn and transit side side warp up and down. It is good also as an organization which a warp ground yarn binder yarn falls in a transit side side as an organization of the warp ground yarn binder yarn in that case in the part or all the locations between the parts which pass the top-face side [1 or 2] woof bottom, and passes the transit side side woof bottom. Binding of the two-layer textiles can be carried out firmly, without breaking down a surface organization also as such an organization.

To the warp which forms a top-face side front face, the top-face side warp other than a warp ground yarn binder yarn may be arranged. In order to mill the good paper of front-face nature without a wire mark, as for top-face side warp and a warp ground yarn binder yarn, it is desirable to consider as the organization which forms the precise front face which passed through and carried out weaving of a top-face side [1 or 2] woof top and the bottom. Since fiber support nature improves since the number of fiber supporting points will increase if the textile front face which consists of top-face side warp, a warp ground yarn binder yarn, and the top-face side woof especially is made into plain weave structure, and texture becomes fine, it is effective in excelling in surface smooth nature.

[0008]

In transit side side warp, it considered as warp wear mold structure. It is for the slot of the cross direction formed between the woof seen with the textiles of a woof wear mold by considering as a warp wear mold organization not to occur. With the textiles of a woof wear mold organization, dehydrators, such as foil and a blade, entered the slot of this cross direction like a wedge, and the transit side side woof might receive intense wear which was struck. This is a phenomenon produced since dehydrators, such as foil and a blade, are extended in the same direction as the extended direction of the slot which exists between the woof and are arranged in it. In order to lose the slot of the cross direction formed between this woof, it considered as the warp wear mold organization. By this, textiles can run a dehydrator top smoothly, and the secondary effectiveness that load up can be controlled also does them so, without intense wear arising to the transit side side woof which touches

dehydrators, such as foil and a blade, and transit side side warp. Moreover, by considering as a warp wear mold organization, it becomes the structure where the transit side side woof forms upward crimp, and a warp ground yarn binder yarn becomes possible [carrying out binding of the transit side side textiles] in the location where crimp approached the top-face side. That is, the location where a warp ground yarn binder yarn passes the transit side side woof bottom, and carries out binding of the transit side side textiles turns into a location close to the top-face side between the parts where the transit side side woof passes the transit side side warp bottom. By considering as such structure, since a warp ground yarn binder yarn is not rapidly drawn in a transit side side, the paper which a local crevice does not occur and does not have a wire mark with good front-face nature can be milled.

[0009]

In the textiles of this invention, it is good also as structure which arranges the auxiliary woof binder yarn made into 2 sets [1] between the top-face side woof depending on the case. Fiber support nature and the binding force can be raised by arranging an auxiliary woof binder yarn. It considers as the organization for which another side weaves transit ***** with the down side in which the two or more top-face side warp bottom is passed as an organization of an auxiliary woof binder yarn, crimp is formed in a top-face side front face, and one side forms the top-face side front face, and 1 set of 2 auxiliary woof binder yarns appear in a top-face side by turns, it weaves with top-face side warp, and the organization of real auxiliary woof binder yarn 1 duty is formed in a top-face side. What counted 1 set among top-face side warp here as top-face side [1] warp when the warp ground yarn binder yarn had been arranged by 2 sets [1] not to mention top-face side warp is included. In the case of the structure which has arranged 1 set of warp ground yarn binder yarns, and top-face side warp alternately [1], two or more adjoining top-face side warp says the thing of the organization which passes along the 1 set of warp ground yarn binder yarn bottom arranged top-face side [at least 1] warp and next to it.

Even when the organization of a warp ground yarn binder yarn and an auxiliary woof binder yarn stationed by 2 sets [1] is the same, even if they differ, it does not matter. Since they are top-face side surface configuration yarn, they should just be organizations which 2 1 set of warp ground yarn binder yarn and an auxiliary woof binder yarn form the organization of real warp 1 duty and auxiliary woof 1 duty on a textile front face, and do not injure a surface organization.

[0010]

The yarn used for this invention can use the yarn which carried out twisting the finished yarn which performed others, multifilament, span yarn, crimp processing, bulky processing, etc. of a monofilament, and which is generally called textured yarn, bulked yarn, and stretch yarn, or these that what is necessary is just to choose by the function of each yarn on an application or textiles etc., and was combined. Moreover, the cross-section configuration of yarn can also use yarn, such as yarn of short configurations, such as the shape not only of a round shape but a square, and a star type, and elliptical, hollow. Moreover, the quality of the material of yarn can also be chosen freely, and can use polyester, nylon, polyphenylene sulfide, polyvinylidene fluoride, polypropylene, aramid, a polyether ether ketone, polyethylenenaphthalate, polytetrafluoroethylene, cotton, wool yarn, a metal, etc. Of course, the yarn which blended various matter or copolymers and these quality of the materials were made to contain according to the purpose may be used.

It is desirable to use the polyester monofilament which has rigidity in top-face side warp, transit side side warp, and the top-face side woof, and is excellent in dimensional stability generally as a wire for paper making. Moreover, it is desirable to use a polyester monofilament like top-face side warp as a warp ground yarn binder yarn. A class, a wire size, etc. of yarn of top-face side warp and a warp ground yarn binder yarn may be the same, or may differ from each other, and can be chosen from a property, weaving nature, etc. of textiles at any time. However, it is better to use different yarn from roles differing in top-face side warp and a warp ground yarn binder yarn, and warp ground yarn binding being arranged between warp by 2 sets [1]. As for an auxiliary woof binder yarn, it is desirable to use polyester or a polyamide monofilament according to an organization, other conditions, etc.

Moreover, abrasion resistance can be improved, carrying out union securing rigidity to the transit side side woof as which abrasion resistance is required in arranging a polyester monofilament and a

nylon monofilament by turns etc.

[0011]

[Example]

The gestalt of implementation of invention is explained with reference to a drawing based on an example.

Drawing 1, and 3 and 4 are the architectural drawings showing the full organization of the example of this invention. A full organization is the minimum repeat unit of a textile organization, this full organization is connected vertically and horizontally, and the organization of the whole textiles is formed. the odd numbers 1a, 1b, 3a, and 3 which showed warp and a warp ground yarn binder yarn in Arabic numerals, 1, 2, and 3, among those attached the alphabet in the architectural drawing -- the group of the warp ground yarn binder yarn arranged by b...2 sets [1] -- it is -- the even numbers 2, 4, and 6 -- as for ..., top-face side warp and transit side side warp are arranged up and down. [for example,] the woof -- assistance -- the woof -- a binder yarn -- a dash -- having given -- Arabic numerals -- for example, -- one -- ' -- two -- ' -- three -- ' -- being shown -- the alphabet -- having given -- a number -- three -- a -- ' -- three -- b -- ' -- six -- a -- ' -- six -- b -- ' ... is an auxiliary woof binder yarn and the top-face side woof and the transit side side woof are arranged up and down except it. It is shown that, as for x mark, top-face side warp or a warp ground yarn binder yarn forms crimp through a top-face side woof top. ** As for the mark, transit side side warp shows that it is located in the transit side side woof bottom. As for ** mark, a warp ground yarn binder yarn shows that it is located in the transit side side woof bottom. - It is shown that, as for the mark, the auxiliary woof binder yarn forms crimp in a top-face side front face through a top-face side warp or warp ground yarn binder yarn top, and O mark shows that the auxiliary woof binder yarn is located in the transit side side warp bottom.

Although the top-face side woof, the transit side side woof and top-face side warp, and transit side side warp lap up and down for convenience on an architectural drawing and are arranged in this example, it may be shifted and arranged with actual textiles.

[0012]

Example 1

In the architectural drawing of drawing 1, they are the two-layer textiles of ten shafts which have arranged by turns the warp ground yarn binder yarn which turned into warp which forms a top-face side in the group, and top-face side warp, considered the warp ground yarn binder yarn as the organization which forms the organization of warp 1 duty by 2 sets [1], and have arranged top-face side warp and transit side side warp up and down. 1a and 1b become a group, it is woven with the top-face side woof, and the plain weave organization of top-face side warp 1 duty is formed in a top-face side front face, next to it, the top-face side warp 2 is woven with the top-face side woof, and plain weave is formed. Therefore, even if it sees as the textile whole front face, the plain weave organization is formed of warp and the woof.

As an organization of a warp ground yarn binder yarn, warp ground yarn binder yarn 1a passes through a top-face side woof 1' top, subsequently it passes along between top-face side woof 2' and transit side side woof 2', and, subsequently the top-face side woof 3' bottom is passed. Subsequently a top face -- a side -- the woof -- four -- ' -- five -- ' -- six -- ' -- transit -- a field -- a side -- the woof -- four -- ' -- five -- ' -- six -- ' -- between -- a passage -- subsequently -- transit -- a field -- a side -- the woof -- seven -- ' -- the bottom -- a passage -- subsequently -- a top face -- a side -- the woof -- eight -- ' -- nine -- ' -- ten -- ' -- transit -- a field -- a side -- the woof -- eight -- ' -- nine -- ' -- ten -- ' -- between -- passing -- an organization -- ** -- having carried out . Warp ground yarn binder yarn 1b which became it and a group Top-face side woof 10', 1' and transit side side woof 10', It passes along between 1' and, subsequently passes along the transit side side woof 2' bottom. Subsequently Top-face side woof 3', Pass along between 4', transit side side woof 3', and 4', and, subsequently it passes through a top-face side woof 5' top. subsequently -- a top face -- a side -- the woof -- six -- ' -- transit -- a field -- a side -- the woof -- six -- ' -- between -- a passage -- subsequently -- a top-face side woof 7' top -- passing -- subsequently -- between top-face side woof 8' and transit side side woof 8' -- a passage -- subsequently -- the organization of top-face side woof 9' which passes through a top -- it is . From this, warp ground yarn binder yarn 1a with top-face side woof 1', 2', 3', and the down side woven it -- a pair -- becoming -- warp -- ground yarn -- a binder yarn -- one -- b -- transit -- a field --

a side -- the woof -- two -- ' -- the bottom -- passing -- transit -- ***** -- weaving -- doubling -- warp -- ground yarn -- a binder yarn -- one -- b -- a top face -- a side -- the woof -- five -- ' -- six -- ' -- seven -- ' -- eight -- ' -- nine -- ' -- weaving -- uniting -- having -- ***** -- a place -- the bottom -- It turns out that warp ground yarn binder yarn 1a which becomes it and a pair weaves transit ***** through the transit side side woof 7' bottom. Moreover, 3a, and 3b, 5a and 5b ... 9a and 9b are also the same organizations, and each shifts the two woof at a time downward, and is arranged. Although it is the combination of the organization where two warp ground yarn binder yarns differ in this example, you may be the combination of the same organization. Moreover, although the array sequence of two warp ground yarn binder yarns is always the same, it is good also as arrangement which replaced this by turns.

Next to the warp ground yarn binder yarn which became a group, top-face side warp and transit side side warp are arranged up and down. The organization of top-face side warp is a plain weave organization formed through a top-face side [1] woof top and the bottom by turns. Although 1 set of warp ground yarn binder yarns and top-face side [1] warp are arranged by turns on the top-face side front face, it is not limited to this but can change suitably. The arrangement rate of a warp ground yarn binder yarn can also be increased to strengthen the binding force.

In transit side side warp, it considered as the warp wear mold organization which passes along the transit side side [4] woof bottom which continues after passing along the transit side side [1] woof bottom. Without intense wear arising to the transit side side woof and transit side side warp, since the slot of the cross direction between the woof produced in the woof wear mold organization is not generated, it can run a dehydrator top, such as foil and a blade, smoothly, and is hard to produce a load effect etc. by considering as such an organization.

Moreover, by considering as a warp wear mold organization, it becomes the structure where the transit side side woof forms upward crimp, and a warp ground yarn binder yarn becomes possible [carrying out binding of the transit side side textiles] in the location where crimp approached the top-face side. By considering as such structure, a warp ground yarn binder yarn is not rapidly drawn in a transit side side. Drawing 2 is a sectional view in alignment with woof 1' of the architectural drawing of drawing 1 . Transit side side woof 1' forms the crimp of passage facing up for the transit side side warp 4, 6, 8, and 10 bottom which continues the 1-time transit side side warp 2 bottom in 1 cycle. Since transit side side woof 1' is woven in with the transit side side warp 2, it becomes the crimp which approaches a top-face side layer most by hit of the warp ground yarn binder yarn 7 of a center section mostly. And a warp ground yarn binder yarn also weaves transit ***** once in 1 cycle, and the contact part is located in the part in which the upward crimp of the transit side side woof is approaching the top-face side layer. If a warp ground yarn binder yarn carries out binding in this location, even if it is generally a warp ground yarn binder yarn with a wire size smaller than the transit side side woof, it will not be powerfully drawn in the transit side side woof, and a depression will not be given to a textile front face. A warp ground yarn binder yarn will be powerfully drawn in the bottom by the force in which the transit side side woof is woven in for the contact part of a warp ground yarn binder yarn in the case of the warp ground yarn binder yarn 3 neighborhood where drawing in of the transit side side woof is comparatively strong, and will form a local crevice in a top-face side front face according to it.

[0013]

Thus, the example 1 of this invention shown in drawing 1 By having considered as the structure in which arranges a warp ground yarn binder yarn by 2 sets [1], and makes transit ***** warp wear mold structure, and drawing in by the warp ground yarn binder yarn carries out binding in a small location Even if dehydration capacity is a powerful machine at high speed, gap of fibrillation and yarn of internal wear and yarn does not occur, and filterability is uniform. The industrial use multilayer textiles which can run smoothly and can be used for a long period of time so that the binding force may be strong, and it may excel in surface smooth nature and it may slide on a dehydrator top can be offered. Although the warp ground yarn binder yarn has been arranged as 2 sets [1] in this example, it is good also as an organization using an one warp ground yarn binder yarn. For example, there is an organization which has arranged an one warp ground yarn binder yarn and transit side side warp up and down. It is good also as an organization which passes the top-face side [1 or 2] woof bottom, forms a top-face side front face, falls in a transit side side in the part or

all the locations between the top-face side knuckles of a warp ground yarn binder yarn, and passes the transit side side woof bottom as an organization of the warp ground yarn binder yarn in that case. In this case, binding of the two-layer textiles can be carried out firmly, without breaking down a top-face side surface organization similarly as structure which has arranged top-face side warp and an one warp ground yarn binder yarn.

[0014]

Example 2

The architectural drawings of drawing 3 are other examples of this invention, and showed the multilayer textiles of 14 shafts. A notation, arrangement, etc. of yarn are the same as drawing 1. Having arranged by turns the warp ground yarn binder yarn which turned into warp which forms a top-face side in the group, and top-face side warp, the warp ground yarn binder yarn was considered as an organization which turns into an organization of warp 1 duty by 2 sets [1], and has arranged top-face side warp and transit side side warp up and down. 1a and 1b become a group, it is woven with the top-face side woof, and the plain weave organization of top-face side warp 1 duty is formed in a top-face side front face, next to it, the top-face side warp 2 is woven with the top-face side woof, and plain weave is formed. Therefore, even if it sees as the textile whole front face, the plain weave organization is formed of warp and the woof.

warp -- ground yarn -- a binder yarn -- one -- a -- a top face -- a side -- the woof -- one -- ' -- two -- ' -- three -- ' -- four -- ' -- five -- ' -- six -- ' -- weaving -- uniting -- having -- **** -- a place -- the bottom -- Warp ground yarn binder yarn 1b which becomes it and a pair weaves transit ***** through the transit side side woof 4' bottom. It turns out that warp ground yarn binder yarn 1a which becomes it and a pair weaves transit ***** through the transit side side woof 11' bottom with the down side by which warp ground yarn binder yarn 1b is woven with top-face side woof 8', 9', 10', 11', 12', 13', and 14'. Moreover, 3a, and 3b, 5a and 5b ... 9a and 9b are also the same organizations, and each shifts the four woof at a time upward, and is arranged. In this example, two warp ground yarn binder yarns are the combination of a different organization.

Next to the warp ground yarn binder yarn which became a group, top-face side warp and transit side side warp are arranged up and down. The organization of top-face side warp is a plain weave organization formed through a top-face side [1] woof top and the bottom by turns.

[0015]

In transit side side warp, it considered as the warp wear mold organization which passes along the transit side side [6] woof bottom which continues after passing along the transit side side [1] woof bottom. Without intense wear arising to the transit side side woof and transit side side warp, since the slot of the cross direction between the woof produced in the woof wear mold organization is not generated, it can run a dehydrator top, such as foil and a blade, smoothly, and is hard to produce a load effect etc. by considering as such an organization.

Moreover, by considering as a warp wear mold organization, it becomes the structure where the transit side side woof forms upward crimp, and a warp ground yarn binder yarn becomes possible [carrying out binding of the transit side side textiles in the location close to a top-face side]. By considering as such structure, a warp ground yarn binder yarn is not rapidly drawn in a transit side side, and a depression is not given to a top-face side front face. Transit side side woof 1' forms the crimp of passage facing up for the transit side side warp 12, 14, 2, 4, 6, and 8 bottom which continues the 1-time transit side side warp 10 bottom in 1 cycle. Since transit side side woof 1' is woven in with the transit side side warp 10, it becomes the crimp which approaches a top-face side layer most by hit of the warp ground yarn binder yarn 3 between the transit side side warp 10 and the transit side side warp of the degree. And a warp ground yarn binder yarn also weaves transit ***** once in 1 cycle, and the contact part is located in the part in which the upward crimp of the transit side side woof is approaching the top-face side layer. If a warp ground yarn binder yarn carries out binding in this location, even if it is generally a warp ground yarn binder yarn with a wire size smaller than the transit side side woof, it will not be powerfully drawn in the transit side side woof, and a depression will not be given to a textile front face.

Thus, the example 2 of this invention shown in drawing 3 By arranging a warp ground yarn binder yarn by 2 sets [1], and making transit ***** into warp wear mold structure Even if dehydration capacity is a powerful machine at high speed, gap of fibrillation and yarn of internal wear and yarn

does not occur, and filterability is uniform. The industrial use multilayer textiles which can run smoothly and can be used for a long period of time so that the binding force may be strong, and it may excel in surface smooth nature and it may slide on a dehydrator top can be offered.

[0016]

Example 3

The architectural drawings of drawing 4 are other examples of this invention, and arrange 1 set of 2 auxiliary woof binder yarns between the woof of the textiles of an example 1. Since an auxiliary woof binder yarn is an organization which forms the long crimp of warp 4 duty in a top-face side front face at a latitudinal direction, it can raise fiber support nature. Moreover, an auxiliary woof binder yarn is effective in the binding force of textiles improving in order to also carry out the role of a binder yarn.

The organization of top-face side warp, the warp ground yarn binder yarn which became a group, the top-face side woof, transit side side warp, and the transit side side woof is the same as drawing 1.

The organization of 1 set of 2 auxiliary woof binder yarns the top-face side warp bottom of four continuous duties A passage, It passes along the top-face side warp bottom of three continuous duties. Subsequently the transit side side [1] warp bottom Subsequently, a passage, Subsequently, it is the organization which passes along the top-face side warp bottom of two continuous duties, and considered as the structure in which another side wove transit ***** through the transit side side warp bottom with the down side in which one side forms the top-face side front face. The organization of an auxiliary woof binder yarn is good also as an organization which forms the long crimp which passes through the top-face side warp top of warp 4 duty, combining the organization which it was not limited to this and one auxiliary woof binder yarn passes along the top-face side warp bottom of two duties two. The force which will be woven in if one auxiliary woof binder yarn considers as the long crimp which passes along top-face side warp [not much much] bottom becomes weak, and since it becomes difficult to supply the textiles which become easy to move and were stabilized, it is necessary to take an auxiliary woof binder yarn into consideration. The organization of the auxiliary woof binder yarn which became 2 groups, of course is not cared about as a different organization as the same.

Thus, the example 3 of this invention shown in drawing 4 By arranging a warp ground yarn binder yarn and an auxiliary woof binder yarn by 2 sets [1], and making transit ***** into warp wear mold structure Even if dehydration capacity is a powerful machine at high speed, gap of fibrillation and yarn of internal wear and yarn does not occur, and filterability is uniform. The industrial use multilayer textiles which can run smoothly and can be used for a long period of time so that the binding force may be strong, and it may excel in fiber support nature and surface smooth nature and it may slide on a dehydrator top can be offered.

[0017]

[Effect of the Invention]

The warp ground yarn binder yarn which connects a top-face side layer and transit *****, the industrial use multilayer textiles of this invention being woven with the top-face side woof, and forming a part of top-face side front face is arranged. By considering as the structure in which makes transit ***** warp wear mold structure, and the contact part of a warp ground yarn binder yarn carries out binding in a location with little drawing in Front-face nature and filterability are uniform, without forming a local crevice in a front face. Even if dehydration capacity is a powerful machine at high speed, gap of fibrillation and yarn of internal wear and yarn does not occur, the binding force is strong, and it can run smoothly, and can be used for a long period of time so that it may slide on a dehydrator top, and the effectiveness excellent also in fiber support nature is done so.

[Brief Description of the Drawings]

[Drawing 1] It is the architectural drawing showing the full organization of the example 1 of this invention.

[Drawing 2] It is a sectional view in alignment with woof 1' of the example 1 of this invention.

[Drawing 3] It is the architectural drawing showing the full organization of the example 2 of this invention.

[Drawing 4] It is the architectural drawing showing the full organization of the example 3 of this invention.

[Description of Notations]

- 1a. Warp ground yarn binder yarn
- 1b. Warp ground yarn binder yarn
- 2. Top-Face Side Warp and Transit Side Side Warp
- 3a. Warp ground yarn binder yarn
- 3b. Warp ground yarn binder yarn
- 4. Top-Face Side Warp and Transit Side Side Warp
- 5a. Warp ground yarn binder yarn
- 5b. Warp ground yarn binder yarn
- 6. Top-Face Side Warp and Transit Side Side Warp
- 7a. Warp ground yarn binder yarn
- 7b. Warp ground yarn binder yarn
- 8. Top-Face Side Warp and Transit Side Side Warp
- 9a. Warp ground yarn binder yarn
- 9b. Warp ground yarn binder yarn
- 10. Top-Face Side Warp and Transit Side Side Warp
- 11a. Warp ground yarn binder yarn
- 11b. Warp ground yarn binder yarn
- 12. Top-Face Side Warp and Transit Side Side Warp
- 13a. Warp ground yarn binder yarn
- 13b. Warp ground yarn binder yarn
- 14. Top-Face Side Warp and Transit Side Side Warp
- 1'. The top-face side woof and the transit side side woof
- 2'. The top-face side woof and the transit side side woof
- 3'. The top-face side woof and the transit side side woof
- 4'. The top-face side woof and the transit side side woof
- 5'. The top-face side woof and the transit side side woof
- 6'. The top-face side woof and the transit side side woof
- 7'. The top-face side woof and the transit side side woof
- 8'. The top-face side woof and the transit side side woof
- 9'. The top-face side woof and the transit side side woof
- 10'. The top-face side woof and the transit side side woof
- 11'. The top-face side woof and the transit side side woof
- 12'. The top-face side woof and the transit side side woof
- 13'. The top-face side woof and the transit side side woof
- 14'. The top-face side woof and the transit side side woof
- 3a. Auxiliary woof binder yarn
- 3b. Auxiliary woof binder yarn
- Six'a. Auxiliary woof binder yarn
- Six'b. Auxiliary woof binder yarn
- Nine'a. Auxiliary woof binder yarn
- Nine'b. Auxiliary woof binder yarn
- 12'a. auxiliary woof binder yarn
- 12'b. auxiliary woof binder yarn

[Translation done.]

* NOTICES *

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the architectural drawing showing the full organization of the example 1 of this invention.

[Drawing 2] It is a sectional view in alignment with woof 1' of the example 1 of this invention.

[Drawing 3] It is the architectural drawing showing the full organization of the example 2 of this invention.

[Drawing 4] It is the architectural drawing showing the full organization of the example 3 of this invention.

[Description of Notations]

- 1a. Warp ground yarn binder yarn
- 1b. Warp ground yarn binder yarn
2. Top-Face Side Warp and Transit Side Side Warp
- 3a. Warp ground yarn binder yarn
- 3b. Warp ground yarn binder yarn
4. Top-Face Side Warp and Transit Side Side Warp
- 5a. Warp ground yarn binder yarn
- 5b. Warp ground yarn binder yarn
6. Top-Face Side Warp and Transit Side Side Warp
- 7a. Warp ground yarn binder yarn
- 7b. Warp ground yarn binder yarn
8. Top-Face Side Warp and Transit Side Side Warp
- 9a. Warp ground yarn binder yarn
- 9b. Warp ground yarn binder yarn
10. Top-Face Side Warp and Transit Side Side Warp
- 11a. Warp ground yarn binder yarn
- 11b. Warp ground yarn binder yarn
12. Top-Face Side Warp and Transit Side Side Warp
- 13a. Warp ground yarn binder yarn
- 13b. Warp ground yarn binder yarn
14. Top-Face Side Warp and Transit Side Side Warp
- 1'. The top-face side woof and the transit side side woof
- 2'. The top-face side woof and the transit side side woof
- 3'. The top-face side woof and the transit side side woof
- 4'. The top-face side woof and the transit side side woof
- 5'. The top-face side woof and the transit side side woof
- 6'. The top-face side woof and the transit side side woof
- 7'. The top-face side woof and the transit side side woof
- 8'. The top-face side woof and the transit side side woof
- 9'. The top-face side woof and the transit side side woof
- 10'. The top-face side woof and the transit side side woof
- 11'. The top-face side woof and the transit side side woof
- 12'. The top-face side woof and the transit side side woof

13'. The top-face side woof and the transit side side woof
14'. The top-face side woof and the transit side side woof
3a. Auxiliary woof binder yarn
3b. Auxiliary woof binder yarn
Six'a. Auxiliary woof binder yarn
Six'b. Auxiliary woof binder yarn
Nine'a. Auxiliary woof binder yarn
Nine'b. Auxiliary woof binder yarn
12'a. auxiliary woof binder yarn
12'b. auxiliary woof binder yarn

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(54) 【発明の名称】 工業用多層織物

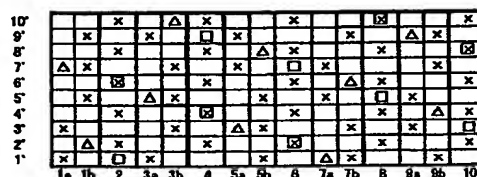
(57) 【要約】

【目的】 上面側織物と縫り合わされて上面側表面を形成しつつ、上面側層と走行面側層を連結する経系地系接続系を2本1組で配置した水性が均一で接結力が強く、表面平滑性に優れた工業用織物を提供する。

【構成】 少なくとも上面側層と走行面側層を備え、上面側層および走行面側層を縫りなす経系地系接続系により上面側層と走行面側層とを連結してなる工業用多層織物において、上面側経系の一部または全部を経系地系接続系とし、走行面側経系が連続する複数本の走行面側緯系の下側を通過して走行面側にロングクリンプを形成することを特徴とする工業用多層織物である。

【選択図】

図1



【特許請求の範囲】

【請求項1】

少なくとも上面側層と走行面側層を備え、上面側層および走行面側層を織りなす経系地系接結系により上面側層と走行面側層とを連結してなる工業用多層織物において、上面側経系の一部または全部を経系地系接結系とし、走行面側経系が連続する複数本の走行面側経系の下側を通過して走行面側にロングクリンプを形成することを特徴とする工業用多層織物。

【請求項2】

経系地系接結系が走行面側経系の下側を通過して走行面側層を接結する位置が、走行面側経系が走行面側経系の下側を通過する部位間で上面側に接近している位置であることを特徴とする、請求項1に記載された工業用多層織物。

【請求項3】

経系地系接結系を2本1組で形成し、該2本1組の経系地系接結系が交互に上面側に現れて上面側経系と織りなし上面側表面に実質上上面側経系1本分の組織を形成する、請求項1または2に記載された工業用多層織物。

【請求項4】

経系地系接結系は、1本または2本の上面側経系の上側を通過する部分間の一部または全部の位置で、該接結系が走行面側に下かって走行面側経系の下側を通過する接結系である、請求項1または2に記載された工業用多層織物。

【請求項5】

上面側経系間に隣接する2本以上の上面側経系の上側を通過して上面側表面にクリンプを形成する補助経系接結系を2本1組で配置し、該2本1組の補助経系接結系が交互に上面側表面に現れて上面側経系と織りなし上面側に実質上補助経系接結系1本分の組織を形成することを特徴とする請求項1ないし4のいずれか1項に記載された工業用多層織物。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】

本発明は抄紙用織物、搬送ベルト、ろ布等の工業用織物に関するものである。

【0002】

【従来の技術】

従来から工業用織物としては経系、緯系で製織した織物が広く使用されており、例えば抄紙用ワイヤーや搬送用ベルト、ろ布等その他の多くの分野で使用されており、用途や使用環境に適した織物特性が要求されている。特に織物の網目を利用して原料の脱水等を行う製紙工程で使用される抄紙用ワイヤーでの要求は厳しく、紙に織物のワイヤーマークを転写することのない表面性に優れた織物、また過酷な環境下においても好適に使用できる程度の剛性を持ち合わせたもの、そして良好な紙を製造するために必要な条件を長期間持続することのできる織物が要求されている。その他にも縦維支持性、製紙の歩留まりの向上、良好なる水性、耐摩耗性、寸法安定性、走行安定性等が要求されている。さらに近年では抄紙マシンが高速化しているため、それに伴い抄紙用ワイヤーへの要求も一段と厳しいものとなっている。

このように工業用織物の中でも要求が厳しい抄紙用織物について説明すればほとんどの工業用織物の要求とその解決について理解できるので、以下抄紙用織物を代表して本発明を説明する。

例えば、抄紙スピードが高速になると必然的に脱水スピードが高速になり、脱水力を強力にする必要がある。それによって当筈縦維や填料等の抜け、ワイヤーマークの発生は顕著になるため、さらなる縦維支持性、表面性の改良が必要となる。また、抄紙用織物に湿紙のくい込みが大きくなったり、縦維のままり込みが発生すると湿紙をフェルトへ移送する場合の湿紙剝離性が悪くなるという問題も発生する。織物上に残って形成された湿紙は脱水力によって、織物表面に押し付けられるため、糸が存在している部分では糸が湿紙にくい込み、逆に糸が存在しない網目間では湿紙が網目にくい込んで湿紙表面上に糸と網目の

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マークを発生させるためである。ワイヤーマークを完全になくすることは不可能であるが、これを極力小さく目立たなくするためには織物の上層表面を細かくし、表面平滑性、及び繊維支持性の向上を図らなくてはならない。しかし、表面性や繊維支持性を重視した目の細かい織物は、基本的に線径の小さい糸で製織されているため耐摩耗性には劣っていた。また、抄紙用織物は高速で走行するためマシンと接触する側の走行面側ではロール等との摩擦によって織物が次第に摩耗していく現象がみられ、摩耗によって寿命が尽きてしまうこともある。耐摩耗性を向上させるには織物組織を緯系摩耗型の組織にしたり、糸の材質を変更したりと様々な対策が必要とされ、特に線径の大きい糸を用いて耐摩耗構造とする方法等が一般的に用いられている。しかし、線径の大きい糸は耐摩耗性は向上するものの優れた表面性を得ることは困難であった。

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表面性と耐摩耗性の両方の問題を解決するために、上面側層と走行面側層にそれぞれ別の経系、緯系を用いて構成した2枚の織物を使用し、両層の織物を接結系によって一体化させた2層織物が用いられてきた。この方法はそれぞれに要求される性能に応じた織物を採用できるという効果があった。上面側層に線径の小さい経系、緯系を用いて密な上層面を形成し、走行面側層に線径の大きい経系、緯系を使用して耐摩耗性の大きい走行面を形成した。接結系には表面性を低下させないために一般的に上面側経系、上面側緯系より小径の糸が使用された。上面側組織は密な表面を形成するために平織が使用されることが多いが、実際には2つの層を織り合わせるために接結系が用いられるので、実質平織表面に接結系が所々に配置された表面が形成されることとなる。接結系はこのように表面に現れる部分も存在するため、表面平滑性の問題から線径のあまり大きい糸を使用することは好ましくはなかった。

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【0008】

また、通常製紙用織物としては使用時には経方向に張力が掛けられることが多く、経方向の糸は常に張力が掛けられている状態であるので織物の走行によって経系がゆるみ移動することはほとんどないが、製織性や繊維支持性等の問題から緯系間に配置されることの多い接結系では、張力が掛かると伸びたり上面側層と走行面側層の間で接結系がまれて内部摩耗が発生し、織物間に隙間が発生したり分離してしまうという問題が生じることがあった。これは無端状織物がいくつかのロールに掛けられて走行しているためであり、ロールに織物が接触する部分ではロールの弧に沿って2層織物が湾曲し織物の各層で周長差が生じる。それによって各層を織り合わせている接結系がまれ、内部摩耗が発生するのである。内部摩耗は表面性向上のために使用されている線径が小さい接結系でよく見受けられる。線径の小さい接結系の上層側層、走行面側層の接結は接結力が不十分であった。また接結系は2枚の織物を連結するために上面側層の糸に絡み、接結力によって糸を引き込むために上面側表面に凹みを与えて織物の表面性を悪化させてしまうという問題もあった。

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そこで、経方向の糸に上面側表面を形成しつつも上面側層と走行面側層を織り合わせる経系地系接結系を用いた多層織物の開発がされてきた。上面側層では上面側表面を形成する経系に上面側経系と経系地系接結系を用い、上面側緯系と織り合わせて上面側表面を形成した。走行面側層は走行面側経系と走行面側緯系によって形成した。さらに接結力の向上や目開きの均一化を目的として、上面側層を形成する経系の全てを経系地系接結系とした織物等も開発された。

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このように2つの層を織り合わせる接結系を経系地系接結系とすることで接結力を強化して内部摩耗の発生を防止し、表面性を悪化させることのない織物とすることができると。しかし、多層織物では接結力や表面性以外の問題も抱えていた。例えば、経系地系接結系を用いた組織としても、脱水性が不均一であると湿紙にマークを与えてしまうことがある。これは、耐摩耗性を向上させるために走行面側層を緯系摩耗型組織としたことが原因となる場合がある。製紙用織物等は摩耗によって寿命が尽きてしまわないようにマシンと接する走行面側表面を緯系摩耗型とすることが多い。通常、織物は経系の延長方向に張力を掛けた状態で、経系の方向に沿って走行しているが、経系が摩耗等によって切断するとそれ以上使用できなくなるためである。経系の摩耗を軽減させるために主として緯系に摩耗を

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負わせることで経糸は切断しにくくなる。しかしこの緯糸摩耗型組織は緯糸間に巾方向の溝が発生するため、この溝にフォイルやブレード等の脱水装置の一部がくさびのように入り込んでスムーズに走行することが困難となったり、下緯糸がたたかれたような激しい摩耗を受けて使用を継続させることが不可能になることがあった。

【0004】

【発明が解決しようとする課題】

本発明は上記の問題に鑑みて、上面側緯糸と織り合わされて上面側表面の一部を形成しつつ上面側層と走行面側層を連結する経糸地糸接結糸を2本1組で配置し、走行面側層を経糸摩耗型構造とすることで、高速で脱水能力が強力なマシンであっても内部摩耗・糸のフィブリル化・糸のズレの発生することがなく、ろ水性が均一で、接結力が強く、表面平滑性に優れ、また脱水装置の上を滑るようにスムーズに走行して長期間使用することができる工業用多層織物を提供しようとするものである。

【0005】

【課題を解決するための手段】

本発明は、

「1. 少なくとも上面側層と走行面側層を備え、上面側層および走行面側層を織りなす経糸地糸接結糸により上面側層と走行面側層とを連結してなる工業用多層織物において、上面側経糸の一部または全部を経糸地糸接結糸とし、走行面側経糸が連続する複数本の走行面側緯糸の下側を通過して走行面側にロングクリンフを形成することを特徴とする工業用多層織物。

2. 経糸地糸接結糸が走行面側緯糸の下側を通過して走行面側層を接結する位置が、走行面側緯糸が走行面側経糸の下側を通過する部位間で上面側に接近している位置であることを特徴とする、1項に記載された工業用多層織物。

3. 経糸地糸接結糸を2本1組で形成し、該2本1組の経糸地糸接結糸が交互に上面側に現れて上面側緯糸と織りなし上面側表面に実質上上面側経糸1本分の組織を形成する、1項または2項に記載された工業用多層織物。

4. 経糸地糸接結糸は、1本または2本の上面側緯糸の上側を通過する部分間の一部または全部の位置で、該接結糸が走行面側に下がって走行面側緯糸の下側を通過する接結糸である、1項または2項に記載された工業用多層織物。

5. 上面側緯糸間に隣接する2本以上の上面側経糸の上側を通過して上面側表面にクリンフを形成する補助緯糸接結糸を2本1組で配置し、該2本1組の補助緯糸接結糸が交互に上面側表面に現れて上面側経糸と織りなし上面側に実質上補助緯糸接結糸1本分の組織を形成することを特徴とする1項ないし4項のいずれが1項に記載された工業用多層織物。」

に関する。

【0006】

【発明の実施の形態】

本発明の工業用織物は抄紙用ワイヤー、搬送用ベルト、ろ布等の工業用織物として使用するものであり、特にユーザーからの要求の厳しい抄紙用ワイヤーとして好適に使用することができる。

本発明は少なくとも上面側層と走行面側層を備え、上面側経糸の一部又は全部を、上面側表面を形成しつつ上面側層と走行面側層を織り合わせる経糸地糸接結糸とし、走行面側組織を経糸摩耗型の2層織物とした。このような組織とすることで高速で脱水能力が強力なマシンであっても内部摩耗・糸のフィブリル化・糸のズレが発生することがなく、ろ水性が均一で、接結力、表面平滑性に優れ、また脱水装置の上を滑るようにスムーズに走行するため長期間使用できる織物を提供することができる。

本発明の多層織物は上面側表面の一部を形成しつつも上面側層と走行面側層を連結する経糸地糸接結糸を織物走行方向に配置した。そして織物の上面側表面は上面側緯糸と織り合わされて密な表面を形成している。

また走行面側織物組織に関しては、走行面側経糸が連続する複数本の走行面側緯糸の下側

を通る経系摩耗型組織とした。そして経系地系接結系が走行面側緯系の下側を通過して走行面側層を接結する位置が、走行面側緯系が走行面側経系の下側を通過する部位間で上面側に接近している位置とした。

【0007】

本発明の特徴である経系地系接結系によって織物を接結することによる効果は、従来の接結するだけで表面組織形成に関与しない接結系とは異なり、該経系地系接結系が上面側表面に現れて上面側経系のように織物表面の一部を形成しているため表面組織に影響を与えない。また経系地系接結系は経方向、つまり一般的にいう走行方向に伸びて常に張力がかけられた状態で使用されているため糸のたるみの発生がなく、織物構造から見ても接結力が強い傾向にある。特に経系地系接結系を2本1組で配置した場合には、さらに接結力を強化することができ、2本1組の経系地系接結系は一方が1本又は2本の上面側緯系の上側を通過して上面側緯系と織り合わせて表面を形成しているところの下側で、もう一方の経系地系接結系が走行面側緯系と織り合わされた構造とすればよい。2本の経系地系接結は交互に上面側表面に現れて1本の経系のように機能しているので、表面組織を崩すことがない。

その他にも1本の経系地系接結系を用いる組織としてもよい。例えば1本の経系地系接結系と走行面側経系を上下に配置した組織等がある。その際の経系地系接結系の組織としては、経系地系接結系が1本または2本の上面側緯系の上側を通過する部分間の一部または全部の位置で走行面側に下がって走行面側緯系の下側を通過する組織としてもよい。このような組織としても表面組織を崩すことなく2層の織物をしっかりと接結することができる。

上面側表面を形成する経系には、経系地系接結系の他に上面側経系を配置してもよい。ワイヤマークのない表面性のよい紙を抄造するためには、上面側経系、経系地系接結系は1本または2本の上面側緯系の上、下を通過して製織した密な表面を形成する組織とすることが好ましい。特に上面側経系、経系地系接結系と上面側緯系からなる織物表面を平織構造とすると繊維支持点数が増加するため繊維支持性が向上し、また織り目が細くなるため表面平滑性に優れるという効果がある。

【0008】

走行面側経系においては、経系摩耗型構造とした。経系摩耗型組織とすることで緯系摩耗型の織物で見られた緯系間に形成される巾方向の溝が発生することがないためである。緯系摩耗型組織の織物ではこの巾方向の溝にフォイルやブレード等の脱水装置がくさびのように入り込んで走行面側緯系は叩かれたような激しい摩耗を受けることがあった。これはフォイルやブレード等の脱水装置が緯系間に存在する溝の延長方向と同じ方向に伸びて配置されているために生じる現象である。この緯系間に形成される巾方向の溝をなくすために経系摩耗型組織とした。これによって織物は脱水装置上をスムーズに走行することができ、フォイルやブレード等の脱水装置と接する走行面側緯系、走行面側経系に激しい摩耗が生じることなく負荷上昇を抑制できるという副次的な効果も奏する。また、経系摩耗型組織とすることによって、走行面側緯系が上向きのクリンフを形成する構造となり、クリンフが上面側に接近した位置で経系地系接結系が走行面側織物を接結することが可能となる。つまり、経系地系接結系が走行面側緯系の下側を通過して走行面側織物を接結する位置が、走行面側緯系が走行面側経系の下側を通過する部位間の、上面側に接近している位置となる。このような構造とすることで、経系地系接結系が走行面側に急激に引き込まれることがないため、局部的な凹部が発生することがなく、表面性が良好なワイヤマークのない紙を抄造することができる。

【0009】

本発明の織物において、場合によっては上面側緯系間に2本1組とした補助緯系接結系を配置する構造としてもよい。補助緯系接結系を配置することで繊維支持性、接結力を向上させることができる。補助緯系接結系の組織としては2本以上の上面側経系の上側を通過して上面側表面にクリンフを形成し、一方が上面側表面を形成しているところの下側でもう一方が走行面側層を織り合わせる組織とし、2本1組の補助緯系接結系が交互に上面側

に現れて上面側経系と織りなし、上面側に実質補助緯系接結系1本分の組織を形成する。ここでいう上面側経系とは、上面側経系はもちろんのこと、経系地系接結系を2本1組で配置した場合は1組を1本の上面側経系としてカウントしたものも含み、1組の経系地系接結系と上面側経系を1本交互に配置した構造の場合には、隣接する上面側経系2本以上とは、少なくとも1本の上面側経系とその隣に配置された1組の経系地系接結系の上側を通る組織のことをいう。

2本1組で配置された経系地系接結系、補助緯系接結系の組織は同一でも、異なっても構わない。それらは上面側表面構成系であるため2本1組の経系地系接結系、補助緯系接結系が織物表面で実質経系1本分、補助緯系1本分の組織を形成し、表面組織を害さない組織であればよい。

【0010】

本発明に使用される糸は用途、あるいは織物上での各糸の機能によって選択すればよく、例えば、モノフィラメントの他、マルチフィラメント、スパンヤーン、撚縮加工や嵩高加工等を施した一般的にテクスチャードヤーン、バルキーヤーン、ストレッチヤーンと称される加工糸、あるいはこれらを撚り合わせる等して組み合わせた糸が使用できる。また、糸の断面形状も円形だけでなく四角形状や星型等の短形状の糸や楕円形状、中空等の糸が使用できる。また、糸の材質も自由に選択でき、ポリエステル、ナイロン、ポリフェニレンサルファイド、ポリフッ化ビニリデン、ポリプロピレン、アラミド、ポリエーテルエーテルケトン、ポリエチレンナフタレート、ポリテトラフルオロエチレン、綿、ウール、金属等が使用できる。もちろん、共重合体やこれらの材質に目的に応じてさまざまな物質をブレンドしたり含有させた糸を使用してもよい。

抄紙用ワイヤーとしては一般的には、上面側経系、走行面側経系、上面側緯系には剛性があり、寸法安定性に優れたポリエステルモノフィラメントを用いるのが好ましい。また、経系地系接結系としては上面側経系と同様ポリエステルモノフィラメントを用いるのが好ましい。上面側経系と経系地系接結系の糸の種類や線径等は同じであっても、異なるものであってもよく、織物の性質や製織性等から随時選択できる。しかし、上面側経系と経系地系接結系では役割が異なり、また経系地系接結は2本1組で経系間に配置されることから、異なる糸を用いた方がよい。補助緯系接結系は組織やその他の条件等によってポリエステル、またはポリアミドモノフィラメントを用いるのが好ましい。

また、耐摩耗性が要求される走行面側緯系にはポリエステルモノフィラメントとナイロンモノフィラメントを交互に配置する等、交織するのが剛性を確保しつつ耐摩耗性を向上できる。

【0011】

【実施例】

発明の実施の形態を実施例にもとづき図面を参照して説明する。

図1、3、4は本発明の実施例の完全組織を示す意匠図である。完全組織とは、織物組織の最小の繰り返し単位であって、この完全組織が上下左右につながって織物全体の組織が形成される。意匠図において、経系、および経系地系接結系はアラビア数字、例えば1、2、3で示し、そのうちアルファベットを付した奇数番号1a、1b、3a、3b・・・は2本1組で配置した経系地系接結系の組であって、偶数番号2、4、6・・・は上面側経系と走行面側経系が上下に配置されている。緯系、補助緯系接結系はグッシュを付したアラビア数字、例えば1'、2'、3'で示し、アルファベットを付した番号3a'、3b'、6a'、6b'・・・は補助緯系接結系であり、それ以外は上面側緯系、走行面側緯系が上下に配置されている。×印は上面側経系、または経系地系接結系が上面側緯系の上側を通してクリンプを形成していることを示し、□印は走行面側経系が走行面側緯系の上側に位置していることを示し、△印は経系地系接結系が走行面側緯系の下側に位置していることを示し、●印は補助緯系接結系が上面側経系、または経系地系接結系の上側を通して上面側表面にクリンプを形成していることを示し、○印は補助緯系接結系が走行面側経系の下側に位置していることを示す。

本実施例では上面側緯系と走行面側緯系、上面側経系と走行面側経系が意匠図上において

、便宜上上下に重なって配置されているが、実際の織物ではずれて配置されることがある

【0012】

実施例1

図1の意匠図において、上面側を形成する経系に組になった経系地系接結系と上面側経系を交互に配置し、経系地系接結系は2本1組で経系1本分の組織を形成する組織とし、上面側経系と走行面側経系を上下に配置した10シャフトの2層織物である。1aと1bが組になって上面側緯系と織り合わされて上面側表面に上面側経系1本分の平織組織を形成しており、その隣りでは上面側経系2が上面側緯系と織り合わされて平織を形成している。そのため織物表面全体としてみても、経系と緯系によって平織組織が形成されている。経系地系接結系の組織としては、経系地系接結系1aは上面側緯系1'の上を通過し、次いで上面側緯系2'と走行面側緯系2'の間を通り、次いで上面側緯系8'の上側を通過し次いで、上面側緯系4'、5'、6'と走行面側緯系4'、5'、6'の間を通り、次いで走行面側緯系7'の下側を通り、次いで上面側緯系8'、9'、10'と走行面側緯系8'、9'、10'の間を通る組織とした。それと組になった経系地系接結系1bは、上面側緯系10'、1'と走行面側緯系10'、1'の間を通り、次いで走行面側緯系2'の下側を通り、次いで上面側緯系3'、4'と走行面側緯系3'、4'の間を通り、次いで上面側緯系5'の上を通過し、次いで上面側緯系6'と走行面側緯系6'の間を通り、次いで上面側緯系7'の上側を通過し、次いで上面側緯系8'と走行面側緯系8'の間を通り、次いで上面側緯系9'の上を通過する組織である。これより、経系地系接結系1aが上面側緯系1'、2'、8'と織り合わされているところの下側で、それと対になる経系地系接結系1bが走行面側緯系2'の下側を通過して走行面側層を織り合わせ、経系地系接結系1bが上面側緯系5'、6'、7'、8'、9'と織り合わされているところの下側で、それと対になる経系地系接結系1aが走行面側緯系7'の下側を通過して走行面側層を織り合わせていることがわかる。また3aと3b、5aと5b・・・9aと9bも同様の組織であり、それぞれは下方向に緯系2本ずつずれて配置されている。本実施例においては2つの経系地系接結系は異なる組織の組み合わせであるが、同じ組織の組み合わせであっても構わない。また2つの経系地系接結系の配列順序は常に同じであるが、これを交互に入れ替えた配置としてもよい。

組になった経系地系接結系の隣には上面側経系と走行面側経系が上下に配置されている。上面側経系の組織は1本の上面側緯系の上、下を交互に通って形成される平織組織である。上面側表面では1組の経系地系接結系、1本の上面側経系が交互に配置されているが、これに限定されず適宜変更できる。接結力を強化したい場合には経系地系接結系の配置割合を増やすこともできる。

走行面側経系においては、1本の走行面側緯系の上側を通った後連続する4本の走行面側緯系の下側を通る経系摩擦型組織とした。このような組織とすることで、緯系摩擦型組織で生じていた緯系間の中方向の溝が生じることがないため、走行面側緯系、走行面側経系に激しい摩擦が生じることなく、フォイルやブレード等の脱水装置の上をスムーズに走行することができ、負荷変動等も生じ難いものとなる。

また、経系摩擦型組織とすることによって、走行面側緯系が上向きのクリンフを形成する構造となり、クリンフが上面側に接近した位置で経系地系接結系が走行面側織物を接結することが可能となる。このような構造とすることで、経系地系接結系が走行面側に急激に引き込まれることがない。図2は図1の意匠図の緯系1'に沿った断面図である。走行面側緯系1'は1サイクルで1回走行面側経系2の下側を通り、連続する走行面側経系4、6、8、10の上側を通り上向きのクリンフを形成している。走行面側緯系1'は走行面側経系2によって織り込まれているため、そのほぼ中央部の経系地系接結系7の当たりで最も上面側層に接近するクリンフとなる。そして経系地系接結系も1サイクルで1回走行面側層を織り合わせており、その接結部は走行面側緯系の上向きのクリンフが上面側層に接近している部分に位置する。経系地系接結系がこの位置で接結すると、一般的に走行面側緯系よりも線径の小さい経系地系接結系であっても走行面側緯系に強力に引き込まれる

ことがなく、織物表面に凹みを与えることもない。もし経系地系接結系の接結部が、比較的走行面側緯系の引き込みの強い経系地系接結系8付近の場合には、経系地系接結系は走行面側緯系の織り込まれる力によって下側に強力に引き込まれて上面側表面に局部的な凹部を形成してしまうのである。

【0013】

このように図1に示した本発明の実施例1は、経系地系接結系を2本1組で配置し、走行面側層を経系摩擦型構造とし、経系地系接結系による引き込みが小さい位置で接結する構造としたことで、高速で脱水能力が強力なマシンであっても内部摩擦・系のフィブリル化・系のズレの発生することがなく、ろ水性が均一で、接結力が強く、表面平滑性に優れ、また脱水装置の上を滑るようにスムーズに走行して長期間使用することができ工業用多層織物を提供することができる。本実施例では経系地系接結系を2本1組として配置したが、その他にも1本の経系地系接結系を用いる組織としてもよい。例えば1本の経系地系接結系と走行面側経系を上下に配置した組織等がある。その際の経系地系接結系の組織としては、1本または2本の上面側緯系の上側を通過して上面側表面を形成し、経系地系接結系の上面側ナックル間の一部または全部の位置で走行面側に下がって走行面側緯系の下側を通過する組織としてもよい。この場合、上面側経系と1本の経系地系接結系を配置した構造としても、同様に上面側表面組織を崩すことなく2層の織物をしっかりと接結することができる。

【0014】

実施例2

図8の意匠図は本発明の他の実施例であり、14シャフトの多層織物を示した。系の記号や配置等は図1と同じである。

上面側を形成する経系に組になった経系地系接結系と上面側経系を交互に配置し、経系地系接結系は2本1組で経系1本分の組織になるような組織とし、上面側経系と走行面側経系を上下に配置した。1aと1bが組になって上面側緯系と織り合わされて上面側表面に上面側経系1本分の平織組織を形成しており、その隣りでは上面側経系2が上面側緯系と織り合わされて平織を形成している。そのため織物表面全体としてみても、経系と緯系によって平織組織が形成されている。

経系地系接結系1aが上面側緯系1', 2', 3', 4', 5', 6'と織り合わされているところの下側で、それと対になる経系地系接結系1bが走行面側緯系4'の下側を通過して走行面側層を織り合わせており、経系地系接結系1bが上面側緯系8', 9', 10', 11', 12', 13', 14'と織り合わされているところの下側で、それと対になる経系地系接結系1aが走行面側緯系11'の下側を通過して走行面側層を織り合わせていることがわかる。また3aと3b、5aと5b・・・9aと9bも同様の組織であり、それぞれは上方向に緯系4本ずつずれて配置されている。本実施例においては2つの経系地系接結系は異なる組織の組み合わせである。

組になった経系地系接結系の隣には上面側経系と走行面側経系が上下に配置されている。上面側経系の組織は1本の上面側緯系の上、下を交互に通って形成される平織組織である。

【0015】

走行面側経系においては、1本の走行面側緯系の上側を通った後連続する6本の走行面側緯系の下側を通る経系摩擦型組織とした。このような組織とすることで、緯系摩擦型組織で生じていた緯系間の中方向の溝が生じることがないため、走行面側緯系、走行面側経系に激しい摩擦が生じることなく、フォイルやブレード等の脱水装置の上をスムーズに走行することができ、負荷変動等も生じ難いものとなる。

また、経系摩擦型組織とすることによって、走行面側緯系が上向きにクリンフを形成する構造となり、経系地系接結系が走行面側織物を上面側に接近した位置で接結することが可能となる。このような構造とすることで、経系地系接結系が走行面側に急激に引き込まれることがなく、上面側表面に凹みを与えることがない。走行面側緯系1'は1サイクルで1回走行面側経系10の下側を通り、連続する走行面側経系12、14、2、4、6、8

の上側を通り上向きのクリンフを形成している。走行面側緯系1'は走行面側経系10によって織り込まれているため、走行面側経系10とその次の走行面側経系の間にある経系地系接結系8の当たりで最も上面側層に接近するクリンフとなる。そして経系地系接結系も1サイクルで1回走行面側層を織り合わせており、その接結部は走行面側緯系の上向きのクリンフが上面側層に接近している部分に位置する。経系地系接結系がこの位置で接結すると、一般的に走行面側緯系よりも線径の小さい経系地系接結系であっても走行面側緯系に強力に引き込まれることなく、織物表面に凹みを与えることもない。

このように図8に示した本発明の実施例2は、経系地系接結系を2本1組で配置し、走行面側層を経系摩擦型構造とすることで、高速で脱水能力が強力なマシンであっても内部摩擦・系のフィブリル化・系のズレの発生することがなく、ろ水性が均一で、接結力が強く、表面平滑性に優れ、また脱水装置の上を滑るようにスムーズに走行して長期間使用することが出来る工業用多層織物を提供することが出来る。

【0016】

実施例3

図4の意匠図は本発明の他の実施例であり、実施例1の織物の緯系間に2本1組の補助緯系接結系を配置したものである。補助緯系接結系は上面側表面に緯方向に経系4本分のロングクリンフを形成する組織であるため繊維支持性を向上させることが出来る。また、補助緯系接結系は接結系の役割もするため織物の接結力が向上する効果もある。

上面側経系、組になった経系地系接結系、上面側緯系、走行面側経系、走行面側緯系の組織は図1と同じである。

2本1組の補助緯系接結系の組織は連続した4本分の上面側経系の上側を通り、次いで連続した3本分の上面側経系の下側を通り、次いで1本の走行面側経系の下側を通り、次いで連続した2本分の上面側経系の下側を通る組織であり、一方が上面側表面を形成しているところの下側でもう一方が走行面側経系の下側を通して走行面側層を織り合わせた構造とした。補助緯系接結系の組織はこれに限定されたものではなく、例えば1本の補助緯系接結系が2本分の上面側経系の上側を通る組織を2本組み合わせて、経系4本分の上面側経系の上を通過するロングクリンフを形成する組織としてもよい。1本の補助緯系接結系があまり多くの上面側経系の上側を通るロングクリンフとすると織り込む力が弱くなって補助緯系接結系は移動しやすくなり、安定した織物を供給することが困難となるため考慮する必要がある。もちろん2本組になった補助緯系接結系の組織を同じとしても異なる組織としても構わない。

このように図4に示した本発明の実施例3は、経系地系接結系、補助緯系接結系を2本1組で配置し、走行面側層を経系摩擦型構造とすることで、高速で脱水能力が強力なマシンであっても内部摩擦・系のフィブリル化・系のズレの発生することがなく、ろ水性が均一で、接結力が強く、繊維支持性、表面平滑性に優れ、また脱水装置の上を滑るようにスムーズに走行して長期間使用することが出来る工業用多層織物を提供することが出来る。

【0017】

【発明の効果】

本発明の工業用多層織物は上面側緯系と織り合わされて上面側表面の一部を形成しつつ上面側層と走行面側層を連結する経系地系接結系を配置し、走行面側層を経系摩擦型構造とし、経系地系接結系の接結部が引き込みの少ない位置で接結する構造とすることで、表面に局部的な凹部が形成されることなく、表面性、ろ水性が均一で、高速で脱水能力が強力なマシンであっても内部摩擦・系のフィブリル化・系のズレの発生することがなく、接結力が強く、脱水装置の上を滑るようにスムーズに走行して長期間使用することができ、繊維支持性にも優れた効果を奏する。

【図面の簡単な説明】

【図1】本発明の実施例1の完全組織を示す意匠図である。

【図2】本発明の実施例1の緯系1'に沿った断面図である。

【図3】本発明の実施例2の完全組織を示す意匠図である。

【図4】本発明の実施例3の完全組織を示す意匠図である。

【符号の説明】

- 1 a. 経系地系接結系
- 1 b. 経系地系接結系
- 2. 上面側経系・走行面側経系
- 3 a. 経系地系接結系
- 3 b. 経系地系接結系
- 4. 上面側経系・走行面側経系
- 5 a. 経系地系接結系
- 5 b. 経系地系接結系
- 6. 上面側経系・走行面側経系
- 7 a. 経系地系接結系
- 7 b. 経系地系接結系
- 8. 上面側経系・走行面側経系
- 9 a. 経系地系接結系
- 9 b. 経系地系接結系
- 10. 上面側経系・走行面側経系
- 11 a. 経系地系接結系
- 11 b. 経系地系接結系
- 12. 上面側経系・走行面側経系
- 13 a. 経系地系接結系
- 13 b. 経系地系接結系
- 14. 上面側経系・走行面側経系
- 1'. 上面側緯系・走行面側緯系
- 2'. 上面側緯系・走行面側緯系
- 3'. 上面側緯系・走行面側緯系
- 4'. 上面側緯系・走行面側緯系
- 5'. 上面側緯系・走行面側緯系
- 6'. 上面側緯系・走行面側緯系
- 7'. 上面側緯系・走行面側緯系
- 8'. 上面側緯系・走行面側緯系
- 9'. 上面側緯系・走行面側緯系
- 10'. 上面側緯系・走行面側緯系
- 11'. 上面側緯系・走行面側緯系
- 12'. 上面側緯系・走行面側緯系
- 13'. 上面側緯系・走行面側緯系
- 14'. 上面側緯系・走行面側緯系
- 3 a. 補助緯系接結系
- 3 b. 補助緯系接結系
- 6' a. 補助緯系接結系
- 6' b. 補助緯系接結系
- 9' a. 補助緯系接結系
- 9' b. 補助緯系接結系
- 12' a. 補助緯系接結系
- 12' b. 補助緯系接結系

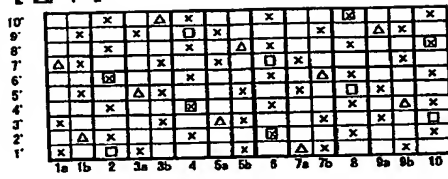
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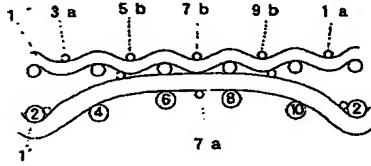
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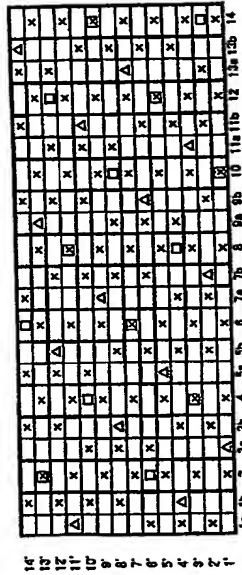
【図 1】



【図 2】



【図 3】



【図 4】

